Dilatation rheology of surfactant adsorption layers

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Although surface dilational rheology has been defined in the sixties, there are still general open questions. Experimental studies of the dilational elasticity of surfactant adsorption layers have shown that at sufficiently high deformation frequencies the elasticity does not increase as expected from simple thermodynamic models but levels off or passes through a maximum with increasing concentration. The location of such maximum is not related to the CMC of the surfactant but at much lower concentrations. So far there are quite a number of attempts to explain this phenomenon. Recently we suggested that a good explanation is the assumption of a certain compressibility of adsorbed surfactant molecules. The presentation gives an overview of the thermodynamic background as well as the impact on the equilibrium and dynamic properties of adsorption layers when a certain compressibility is considered. Examples are given obtained from oscillating drop and bubble experiments.

ACS Award in Colloid and Surface Chemistry Symposium Honoring Clay Radke
8:30 AM-11:50 AM, Monday, March 24, 2003 Convention Center -- Room 288, Oral

Division of Colloid and Surface Chemistry
The 225th ACS National Meeting, New Orleans, LA, March 23-27, 2003